

# Somalia

This climate fact sheet summarizes the available information on the climate of Somalia and the impact of climate change on humanitarian activities in-country. Each fact sheet in the series was written using information from peer-reviewed academic papers, government publications, and other documentation from international non-governmental organizations.

## 1. Climate overview

**Average annual temperature:** Mean temperatures across the country do not vary significantly with the season and remain between 25–28°C year-round.

**Average annual rainfall:** Rainfall varies strongly across the country; northern and central parts experience considerably lower rainfall than the south, with the exception of the Northern Plateau. Rainfall in some parts of the central, semi-arid areas of the country is as low as 50–150mm per year, while parts of the south can receive more than 400mm per year. The highest rainfall is in the south-west with around 600mm rainfall per year.

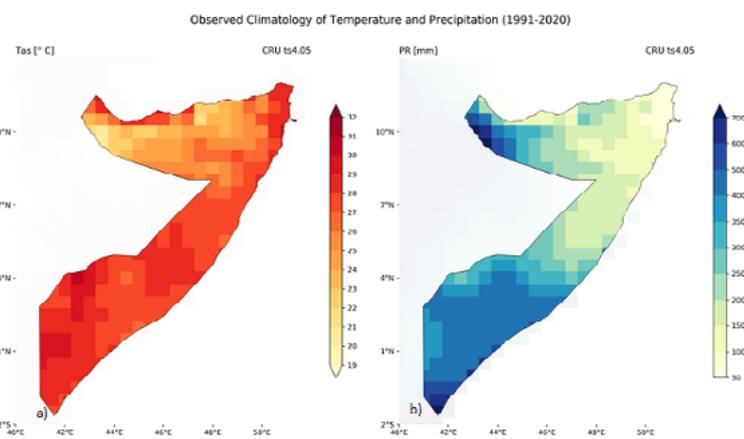


Figure 1. Observed climatology of (left to right) mean temperature and annual mean total precipitation 1991–2020. (Adapted from World Bank, 2021a).

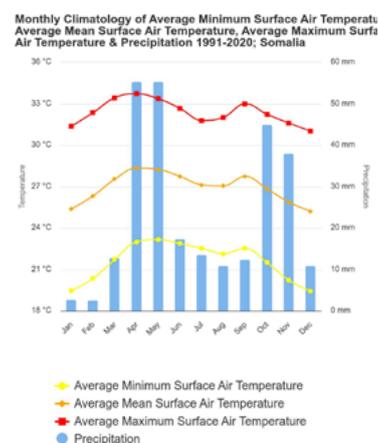


Figure 2. Average monthly climatology in Somalia 1991–2020. (from World Bank Climate Change Knowledge Portal).

## Short overview

The climate in Somalia ranges from arid in the majority of the country (hot desert to semi-arid) to tropical wet and dry (tropical savanna). The northern parts of the country experience mean temperatures as low as 19°C, while the central and southern parts experience higher temperatures with average values around 30°C. There are two main rainfall seasons from April to June (*Gu*) and between October to December (*Deyr*). Rainfall and temperature in Somalia are influenced by several factors, including the Inter-Tropical Convergence Zone (ITCZ), monsoonal winds and ocean currents, the Somali Jetstream (also known as the Somalia Current), easterly waves, tropical cyclones, the Indian Ocean’s variable sea-surface temperatures and the El Niño–Southern Oscillation (ENSO) (World Bank, 2021a). During El Niño periods, parts of Somalia typically experience wetter than normal conditions and during La Niña periods, drier than usual conditions typically occur.

The diverse and varied geography of Somalia means that it is exposed to a broad array of environmental hazards (hydrometeorological as well as geophysical) which are directly impacted and exacerbated by the impacts of climate change across the country. Ranked 1st out of 191 countries by the 2022 Inform Risk Index, Somalia is considered the most at risk country in the world (DRMKG, 2022).

## 1.1 Climate change in Somalia

### Historical climate change

### Projected climate change

#### Temperature

- The mean annual temperature over Somalia has increased at a rate of approximately 0.1–0.3°C/decade since the 1950s. The average annual temperature in the 2010s was 1.1°C higher than during the 1950s (USAID, 2024). The frequency and intensity of hot extremes have increased and cold extremes have decreased (Seneviratne *et al.*, 2021)
- Mean temperatures over the region are projected to rise until 2050 by at least 1.5–2.5°C for a high greenhouse gas concentration scenario (SSP5–8.5) and by 1–2°C for a low greenhouse gas concentration scenario (SSP2–4.5) (Gutiérrez *et al.*, 2021).
- Maximum and minimum temperature will increase, and heatwaves will intensify in duration and peak temperatures for every increase in global warming levels above the pre-industrial values. In line with rising mean annual temperatures, the annual number of very hot days (days with daily maximum temperature above 35°C) is projected to rise and with high certainty (Gutiérrez *et al.*, 2021; Ranasinghe *et al.*, 2021; Seneviratne *et al.*, 2021).

#### Precipitation

- Overall, there is no clear trend in rainfall or extreme rainfall events due to high year-to-year natural variability.
- Mid-century (2040–2060) estimates of annual precipitation changes over Somalia under a low emission scenario (SSP2–4.5) and a high emissions scenario (SSP5–8.5) are projected to increase by around 10–20 per cent, with enhanced interannual variability (Gutiérrez *et al.*, 2021).
- The frequency and intensity of heavy precipitation events are projected to increase with potential impacts of flooding and soil erosion (Seneviratne *et al.*, 2021).

## 2. Priorities of the Red Cross Red Crescent Movement under climate change

### 2.1 Scale up climate-smart disaster risk reduction (DRR), early action and preparedness

Existing hydrometeorological hazard	Projected risks
<b>Floods</b>	
<p>Somalia is vulnerable to, and experiences, regular river floods and flash floods. River flooding typically occurs along the Juba and Shabelle Rivers in southern Somalia, and flash flooding is more common in the north along the intermittent streams of the country (FAO, 2022b). Recent years have seen an increase in the severity and frequency of floods (FAO, 2022b) with some of the most severe events occurring in 1961, 1977, 1997 and 2006 in the <i>Deyr</i> season, and in 1981 and 2005 in the <i>Gu</i> season. All these floods resulted in major economic impacts and damage as well as many human casualties (FAO, 2022b).</p>	<p>Higher rainfall and runoff are expected in the <i>Deyr</i> season across the various climate scenarios, which would lead to the increased threat of flash flooding (Government of Somalia, 2022).</p>
<b>Droughts</b>	
<p>As of 2015, Somalia has been experiencing severe drought conditions, worsened by the impacts of El Niño in 2015/16 (OCHA, 2016). Currently, the number of people affected by droughts has risen from 4.9 million in March 2022 to 6.1 million in April 2022; of whom, 760,000 people are displaced and in urgent need of shelter, food and access to basic health services (OCHA, 2022).</p>	<p>Haile <i>et al.</i> (2020) project that drought event duration, frequency and intensity will increase by the end of the 21st century under all greenhouse gas concentration scenarios. Drought areas will increase by 16 per cent, 36 per cent and 54 per cent under increasing Representative Concentration Pathways (RCPs) (2.6, 4.6, 8.5 respectively).</p>

It is important to note that many of these hazards are interrelated and produce compound risks in the same areas and communities. In addition, risk must be understood as the interplay between hazard, exposure and vulnerability which makes certain individuals, communities and sectors more impacted by the hazards. All project design should take such compounding risks into account.

#### Disaster risk management strategies

Somalia Water and Land Information Management (SWALIM) is one example of an information management programme run by the Food and Agriculture Organization (FAO) in Somalia. SWALIM provides early warning information through regular updates on water resources with a focus on drought and flood risk early warning. However, the Somali Government in the most recent National Water Resource Strategy (2021–2015) has identified that a key challenge to water resource and DRR is the lack of available meteorological and hydrological information and data (Government of Somalia, 2021).

## Disaster risk management law and policies

- [Somalia National Water Resource Strategy 2021-2025](#). Sets out the country's vision for the five-year period and outlines three goals: 1) establishing a functional water sector governance framework; 2) operationalizing integrated water resources management; and 3) improving the provision of priority water services.
- [Somalia Recovery and Resilience Framework \(2018\)](#). Aims to break the cycle of vulnerability and humanitarian crises, inform future financing for DRR and align with the Sustainable Development Goals.
- [National Drought Plan for Somalia \(2020\)](#). The three pillars in the Drought Plan are to: 1) implement a drought monitoring and early warning system; 2) assess drought vulnerability and risk; and 3) implement measures to limit the impacts of drought and better respond to it.

## 2.2 Reduce health impacts of climate change

Climate change will lead to a rise in heat-related health conditions, psychological stress due to droughts, and increased food insecurity and malnutrition (AfDB, 2018). Frequent and higher exposure to heatwaves will increase heat-related mortality. Climate models indicate that the population affected by heatwaves will increase by 21.1 per cent by 2030, while heat-related deaths will increase from 1.3 deaths per 100,000 people to 3.2 deaths per 100,000 people per year until 2030 (Binder *et al.*, 2022).

Hunger and malnutrition, especially in the central and southern regions and particularly among children, are expected to increase with the changing climate due to the disruption of agricultural production (Oberg *et al.*, 2021). According to the Somalia National Bureau of Statistics, as recently as 2021, 27 per cent of children under the age of five are stunted, while 16 per cent are severely stunted (NBS, 2021). In addition, 12 per cent of children under five years old are wasted, while 6 per cent are severely wasted (*ibid*). Yet, this number is expected to increase due to projections of prolonged drought. For example, after the prolonged drought of 2022, there was a sharp increase in cases of malnutrition, especially among children (UNICEF, 2022).

Rising temperatures are projected to increase the incidence of vector-borne and waterborne diseases (such as cholera and diarrhoea due to flooding) (UNICEF, 2022). Temperature rises are also expected to facilitate the breeding areas for vectors such as mosquitoes as well as their expansion into previously uninhabitable areas (Ajuang Ogallo *et al.*, 2018). Due to higher temperatures, skin diseases and respiratory infections (such as pneumonia, asthma and other lung infections) are also expected to increase (AfDB, 2018).

Droughts, floods and high temperatures worsen existing health challenges and compound mental health and trauma caused by long periods of war (Lindvall *et al.*, 2020). Since the 2000s, Al-Shabaab, one of al-Qaeda's strongest allies, has been launching attacks against government forces and civilians with the aim of establishing a 'Greater Somalia', joining all ethnic Somalis under Islamic rule (CFR, 2024). The public health system and health infrastructure are severely constrained by climate variability and protracted armed conflict (Oberg *et al.*, 2021). The shortage of health sector staff and the poor conditions of health service infrastructure – especially in the camps for internally displaced persons (IDP) – aggravates climate change-induced health impacts (Lindvall *et al.*, 2020). In Somalia, less than 30 per cent of the population had access to sufficient medical and health services in 2020 (Gele, 2020).

## 2.3 Ensure sustainable water supplies

### Water, Sanitation and Hygiene (WASH)

Somalia is a downstream riparian – approximately 90 per cent of its waterflow comes from the Ethiopian highlands and Kenya, making Somalia highly reliant on upstream rainfall patterns and water management decisions; for example, recent dam-building activities in Ethiopia. This plays into geo-political tensions in the region. Somalia ranks 154th out of 169 in terms of its water vulnerability (high scores mean higher vulnerability) (ND-GAIN, 2021).

Somalia comprises 80 per cent arid and semi-arid areas, which have reduced capacity to weather climate shocks due to their low water retention levels. This, in turn, amplifies the effects of climate-related extreme events such as droughts and flash floods (Eklöv & Krampe 2019).

Droughts are reducing the availability of ground- and surface water resources and increasing competition for available water (AfDB, 2018). Other climate-induced water risks are decreased water quality (due to floods and droughts), increased water prices as water becomes scarce, infrastructure damage, and salinization of coastal aquifers from sea level rise (*ibid*). Somalia lacks proper drinking water systems, and over 33 per cent of its population lacks access to drinking water (Mourad, 2022; NBS, 2021). Furthermore, 42 per cent of households do not have improved water and sanitation facilities (NBS, 2021). Climate change will make these water and sanitation challenges worse. Notably, water shortages caused by drought may contribute to tensions and conflicts over water access (DanChurchAid *et al.*, 2020). Water scarcity is already a prevailing issue in conflict, and it is projected to escalate as river volumes drop (Eklöv & Krampe, 2019; Barringer, 2017). As water shortages increase, the poor will ultimately bear the brunt of increased water prices (Mourad, 2021).

### Infrastructure and electricity

Somalia has (largely untapped) hydroelectric and other renewable energy potential, including geothermal, solar and wind. The Government of Somalia outlined the ways in which the civil war interrupted this development by halting construction of the Baardheere Dam and derailing upkeep of the already-constructed Fanoole Dam on the Middle Jubba River. Once again, climate change also comes into play, with the severe El Niño season in 1998 shifting the trajectory of the river away from the Fanoole Dam (State Minister for Environment, 2015).

## 2.4 Enable climate-resilient livelihoods and economic security

Temperature rises and recurring floods and droughts due to climate change are causing crop and livestock production declines in Somalia. Crop yields across the country are generally expected to decrease with the changing climate (Binder *et al.*, 2022). Households have already reported declines in crop harvests due to prolonged and intense dry spells, pests and diseases, in addition to other challenges such as low access to agricultural inputs (FAO, 2021).

In Somalia, agriculture is the most important sector in terms of employment, contributing to Gross Domestic Product (GDP) and supporting local livelihoods and food security. The sector employs 80 per cent of the population (ILO, 2021), contributes 75 per cent of the country's GDP and comprises 93 per cent of total exports (World Bank & FAO, 2018). Livestock alone contributes over 60.7 per cent of the GDP (Mourad, 2021) with as many as 80 per cent of livestock keepers being nomadic or semi-nomadic pastoralists (Warsame *et al.*, 2022).

There is growing unpredictability and variability in precipitation and temperature patterns, which makes livelihoods and labour cycles dependent on agriculture and pastoralism more volatile and stressful (Eklöv & Krampe 2019). Interannual variability is especially salient in Somalia, where more extreme weather is shifting seasons. This will also be compounded by the increasing frequency and severity of dry spells (World Bank, 2021b).

Droughts and higher temperatures are expected to reduce soil moisture and water availability for crop and animal production, causing severe losses. Four consecutive dry seasons – with recent *Gu* rainfall seasons becoming increasingly drier – are already killing livestock and crops (UNICEF, 2022). Furthermore, temperature rises and droughts are causing declines in water levels in the Jubba and Shabelle Rivers (southern Somalia) which are the country's high agricultural potential areas (Binder *et al.*, 2022). Water reductions and erosion caused by dry conditions also reduce the available water and pasture areas for livestock farming. Consequently, herders in Somalia are facing declining livestock numbers (ICRC, 2021a). Therefore, climatic changes threaten the livestock subsector leading to widespread food insecurity and loss of livelihoods.

Warming temperatures and increases in droughts are also increasing the incidence of diseases and pests, most notably locust infestations (DanChurchAid *et al.*, 2020; FAO, 2022; Salih *et al.*, 2020). Projected increases in extreme floods due to climate change will destroy crops and displace and claim the lives and livelihoods of farmers foremostly (ICRC, 2021; Warsame *et al.*, 2021). Finally, climate change threatens the fisheries subsector by destroying fish habitats and reducing plankton due to rising temperatures (AfDB, 2018).

## 2.5 Address climate displacement and protection

### Current and future displacement challenges

While displacement in Somalia is mostly due to conflict, droughts, floods and cyclones are also drivers of displacement. At the end of 2023, Somalia had 3.9 million IDPs due to conflict and violence (IDMC, 2024) as well as about 30,000 refugees and asylum seekers, mainly from Ethiopia and Yemen (UNHCR, 2022). Successive droughts have driven many to leave their homes and settle in urban or peri-urban areas such as Baidoa outside of Mogadishu, home to approximately 400,000 IDPs (AA, 2022).

Displacement in Somalia is increasingly climate-driven, with 75 per cent of all new displacements in 2020 attributable to climate events (Hodder, 2022). In total, 919,000 people were affected by floods alone in 2020 of whom 412,000 were displaced (ReliefWeb, 2020), illustrating the variety of climate risks the country faces. In the first half of 2022 alone over 745,000 Somalis were displaced by drought (NRC, 2022). In 2023 drought triggered 331,000 displacements and flooding triggered 1.7 million migrations (IDMC, 2024).

Climate-induced rural–urban migration will fuel Somalia’s already fast urbanization rate, with nearly 65 per cent of the population expected to live in urban areas by 2050 (UNDESA, 2018).

Urban IDPs in Somalia have contested rights and often live in informal settlements without basic services (World Bank, 2021b). Urban settlement is often characterized by highly segregated ethnic groups/clans, yet in-migration risks destabilizing these dynamics (*ibid*). Most IDPs live in informal settlements on private land and face ongoing threats of evictions (UNHCR, 2021).

The climate conditions and severe drought affecting herders and pastoralists often make migration to cities the only viable coping mechanism as herds die out. This trend will likely continue as the country faces more droughts and other hazards (ICRC, 2021). This is particularly notable as 60 per cent of the population lives in rural areas as nomadic or semi-nomadic pastoralists, while 65 per cent of the country’s GDP comes from agricultural activities (World Bank, 2021b).

### Potential needs of migrants and displaced people

As more climate-induced displaced people and other migrants enter urban areas, there is a need for urban climate change adaptation, planned urban expansion, and increased service provision such as a centralized water system, which much of Somalia lacks (REF, 2020).

## Protection

As climate-related security risks increase (GroundTruth Project, 2017), climate sensitivity is becoming mainstreamed in peacekeeping efforts in Somalia. A recent policy brief conducted by the Stockholm International Peace Research Institute revealed that climate change was jeopardizing the UN's peacebuilding mission by constraining governance, limiting judicial systems, and rendering it difficult to provide security (Eklöv & Krampe, 2019). The main driver of this is climate-related loss of livelihoods that is causing internal migration, forced displacement and increases in poverty that, in turn, inflame volatile political dynamics. These cascading impacts highlight some of the key ways in which climate change is amplifying and driving conflict in Somalia.

These cascading impacts are contributing to heightened tensions and threatening the fragile progress that has been made. Climate change has been recognized by both the UN and Government of Somalia as a threat multiplier and as a key driver in the protracted conflict and humanitarian crises that the country is facing (HRW, 2020; Mueller, 2019). Already subject to one of the most protracted conflicts, Somalians must now also grapple with climate shocks and a depleted natural resource base that plays a key role in 'determining the severity of humanitarian crises' (State Minister for Environment, 2015). This was affirmed in the UN Security Council's Resolution 2408, which was passed unanimously in 2018 and formalized the UN's position that climate change is destabilizing the country (Planetary Security Initiative, 2018; UN Security Council, 2018). Climate change was again explicitly linked to the humanitarian situation by the Office for the Coordination of Humanitarian Affairs (OCHA) in 2019 (Ro, 2019). Cumulatively, these impacts have contributed to researchers from the Norwegian Institute of International Affairs calling on the UN Security Council to support the mainstreaming of climate security (Yaw Tchier, 2021).

## 2.6 Policy

### Relevant information from the [Nationally Determined Contribution \(NDC\)](#) (2021)

**Emission target:** Somalia is committed to reducing its emissions by 30 per cent by 2030 compared to the 'business as usual' scenario (107.40MtCO<sub>2</sub>eq by 2030). The agriculture, energy and forestry sectors will be the most impacted by this commitment.

**Area of focus on adaptation:** Agriculture and food security; water resources management and public health; disaster preparedness and management; coastal, marine environment and fisheries; energy; forestry and environment; human settlements; infrastructure including roads and bridges.

**Inclusion of DRR:** Yes, including diverse measures (Early Warning Early Action (EWEA), community resilience to droughts and floods, coordination, displacement, social protection and livelihoods) for an estimated budget of 10 billion US dollars.

**Next review of the NDC:** n/a

**Key stakeholders:**

The following structure is now being implemented after the National Climate Change Policy was approved in 2020:

- Directorate of Environment and Climate Change (DoECC) in the Office of the Prime Minister (policies, coordination, UNFCCC National Focal Point and the National Designated Authority for the Green Climate Fund (GCF)).
- National Climate Change Committee (NCCC) – a high-level policy coordination committee.
- Cross-Sectoral Committee on Climate Change (CSCC) – comprising officials from across government working on climate change.

**Additional note:** The links between conflict and the climate crisis are articulated in the NDC.

### Other national policies on climate

- [Somalia National Climate Change Policy](#) (2020) 'The objective of the policy is to promote and strengthen the implementation of adaptation and disaster risk reduction measures to reduce vulnerability to climate change'.
- Somalia has published a [National Adaptation Plan \(NAP\) Framework](#) in 2022 to guide and promote it's NAP process, ensuring it addresses and aligns the country's medium- and long-term adaptation needs in a coherent and unified way (NAP Global Network, 2022)
- [Somalia Recovery and Resilience Framework: Summary Report \(2018\)](#). This document focuses on drought recovery and resilience building, including displacement, capacity building and resilience financing.

## Climate finance

The Green Climate Fund (GCF) readiness project is currently ongoing in Somalia, but there is currently no active GCF national project (GCF, 2022). National Societies cannot apply directly for climate finance from [the GCF](#), but they can be an implementing partner for an accredited entity (Climate Centre 2022a).

The United Nations Development Programme (UNDP) supports a few projects on climate risk resilience in the country, two of which have a water management focus (UNDP, 2022 a,b,c,d). National Societies can explore options for accessing climate funds through smaller funds, such as the [GEF's Small Grants Programme](#) or the [FFEM's Small Scale Initiatives Program](#). These grants range from 20,000–50,000 US dollars and are intended to support community-level initiatives. The Global Environment Facility (GEF) Small Grants Programme sits under the UNDP and has a [National Coordinator in each country](#). Some countries also have National Climate Funds, which may be accessible to the National Society. Other funding from bilateral donors, national climate funds, or multilateral climate funds like the Adaptation Fund, CREWS, or GCCA+ could be explored (Climate Centre, 2022a).

Engaging in national climate adaptation planning is vital for accessing climate finance.

## Additional resources

Climate Centre. (2022a). *Fact sheet on climate finance*. Red Cross Red Crescent Climate Centre. <https://www.climatecentre.org/wp-content/uploads/Fact-Sheet-on-Climate-Finance.pdf>

Climate Centre. (2022b). *Entry points for National Societies on climate finance partnerships*. Red Cross Red Crescent Climate Centre. <https://www.climatecentre.org/wp-content/uploads/Entry-Points-for-Climate-Finance-Partnerships.pdf>

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